

UNITED STATES PATENT OFFICE.

BENJAMIN ARNOLD, OF EAST GREENWICH, RHODE ISLAND.

IMPROVEMENT IN MACHINES FOR DARNING STOCKINGS.

Specification forming part of Letters Patent No. **138,981**, dated May 20, 1873; application filed September 26, 1870.

To all whom it may concern:

Be it known that I, BENJAMIN ARNOLD, of East Greenwich, in the county of Kent and State of Rhode Island, have invented a new and Improved Machine for Mending Stockings and other Fabrics; and do hereby declare the following to be a full and correct description thereof, reference being had to the accompanying drawing-making part of this specification, and to the letters and numbers of reference marked thereon, similar letters and numbers being used in all the figures to denote the same part.

In the drawing, Figure 1 is a side elevation of the machine. Fig. 2 shows a vertical section taken through the middle lengthwise of the machine. Fig. 3 shows a vertical cross-section of the standard A; Fig. 4, face of the cam *a*. Fig. 5 shows the parts that move the levers *g* and *h* on the periphery of the cams *a* and *i*. Fig. 6 is a top view of the head of the standard A, with the comb *s* and work *x*. Figs. 7 to 12 show different stages of the operation of the needle, looper, &c.

The nature of my invention consists mainly in using a semicircular comb sliding in a curved race-way in an arm projecting out over a spherical block, which supports a needle with an eye near the point, which works up through the stitches on the teeth of the comb, and in giving the comb a proper feed-motion back and forward, &c.

The construction is as follows: A and B are two hollow standards, fastened to the bed-plate C. *d* is a shaft, turning in a bearing in the back of the standard B, holding the two cams *a* and *i* on its inner end, and a hand-wheel, H, to turn it by on its outer end. *e* is the feed-lever, one end of which turns down and catches into the rack on the back of the comb *s*, seen in section in Fig. 3. The other end of this lever is pinned to the top of the lever *g*, Fig. 2, which communicates a backward-and-forward and upward motion to it from the cam *a*, the spring *t* pressing it down. *k* is the looper and casting-off lever, one end of which passes out of an opening in the arm D, so as to operate on the comb outside. The other end of the lever is connected to the top of the lever *h*, which communicates a backward-and-forward and downward motion to

its outer end from the groove in the cam *i*, the spring *u*, Fig. 1, pressing it up. The comb *s* is held on a flange on the arm D, the front half of the arm shutting down on it, so that the back row of teeth are inclosed in the arm with the feed-lever, and the outer row of teeth stand out in front of the arm. A plate, *n*, is placed in the head of the standard A, on which the needle-block *o* slides up and down, guided by two screws in a slot in the plate. (See Fig. 3.) A lever, O, is hung on a pivot underneath the bed-plate C, which communicates motion from a pin in the face of the cam *a* to the needle-block *o*, one end of the lever being connected to the pin by the rod *b*, and the other end to the block by the bar *c*.

The operation is as follows: The stocking is drawn under the comb *s* and over the standard A, until the place to be mended is just under the edge of the comb, so that when the needle *m* rises it will pass up through the edge of the stocking on the front side of the hole, and make the first row of stitches or loops through it. Then, by turning the hand-wheel H, the needle will be pushed up through the work, carrying with it the yarn *p*, and as it descends the looper *k* will be thrown forward and down, holding the loop, as seen in Fig. 11, so that the comb, by sliding one tooth by the needle, will catch the loop and hold it as the needle draws down. In making the first row there are no loops on the comb to be cast off, but in after rows when the needle rises it comes up through the loop or stitch on the tooth in front of it, and the looper *k* moves down and forward until its end is under the loop the needle is in, when, as the needle rises further, the looper rises to and casts off the loop from the point, so that it hangs around the needle, (see Fig. 8,) and as the needle again descends a new loop or stitch is deposited on the tooth of the comb, as above described in making the first row. When a row has been knit across the hole, by reversing the motion of the hand-wheel, a row back to the other side will be made, a part of cam *a*, marked *a'*, Fig. 4, being made so as to fall back and bring the feed-motion right as to time in turning both ways. The cam *i* is attached to this piece *a'*, and falls back in the same way for the same reason.

-It will be seen, by reference to Fig. 2, that the levers *g* and *h* have slots in the middle. These are provided to let the levers *e* and *k* rise and fall, which motions are given by projections on the cams.

Having thus described the construction and operation of my machine, what I claim as my invention, and desire to secure by Letters Patent, is—

1. The comb *s*, in combination with the needle *m*, constructed and operating substantially as and for the purpose set forth.

2. The combination of the feed-lever *e* with the comb *s*, substantially as specified, and for the purpose set forth.

3. The looping and casting-off lever *k* and needle *m*, in combination with the comb *s*, substantially as and for the purpose specified.

4. The combination of the feed-lever *e* and lever *k* with the needle *m* and comb *s*, as and for the purpose specified.

5. The combination of the needle *m* with the standard *A* and slotted plate *n*, substantially as described, and for the purpose set forth.

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Witnesses:

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